17. Describe the two types of AC millivoltmeters: amplifier-rectifier and rectifier-amplifier. Compare their working principles.

18. Explain the block diagram of a Digital Storage Oscilloscope (DSO) and describe the function of each block.

19. What is the principle of impedance measurement using a bridge circuit? Explain with a diagram.

20. What is the role of a quartz oscillator in frequency counters? How does it improve accuracy?

APRIL/MAY 2025

23PSPH44A — BASIC INSTRUMENTATION SKILLS (SEC III)

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Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Mention the difference between accuracy and precision.

2. What is the resolution of an instrument?

3. What is the significance of frequency range in an AC millivoltmeter?

4. What is the purpose of a rectifier in an AC millivoltmeter?

5. Discuss the role of the phosphor screen in a CRO.

6. Define visual persistence in a CRO.

7. What is the working principle of an RLC bridge?

8. How does a pulse generator differ from a function generator?

9. Define resolution in frequency measurement.

10. What is the function of a microprocessor in a digital multimeter?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) What are the advantages and disadvantages of analog and digital multimeters.

Or

(b) Discuss the importance of selecting the appropriate range in a measuring instrument.

12. (a) Describe the working principle of an electronic voltmeter with a block diagram.

Or

(b) Specify the specifications of on electronic voltmeter/multimeter and their significance.

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13. (a) What is an electron gun? Explain its components and their functions in a CRT.

Or

(b) Discuss the key specifications of a DSO and their significance in practical applications.

14. (a) Explain the distortion factor meter and wave analysis.

Or

(b) How is the quality factor (Q) of an inductor measured using a Q-meter? Explain in detail.

15. (a) Discuss the importance of microprocessors in digital multimeters.

Or

(b) Explain the term resolution in digital instruments.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. What is the loading effect in measurement? How does it affect the accuracy of voltage and current measurements?